Volunteer Lake Assessment Program Individual Lake Reports
WINNISQUAM, LACONIA, NH

MORPHOMETRIC DATA

						TROPHIC CLASSIFICATION		KNOWN EXOTIC SPECIES
Watershed Area (Ac.):	291,649	Max. Depth (m):	53	Flushing Rate (yr¹)	2.2	Year	Trophic class	Variable Milfoil
Surface Area (Ac.):	4264	Mean Depth (m):	15.2	P Retention Coef:		1984	OLIGOTROPHIC	
Shore Length (m):	45,400	Volume (m³):	262,306,500	Elevation (ft):	482	1994	OLIGOTROPHIC	

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Cautionary	<5 samples and median is > threshold. More data needed.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Very Good	At least 10 samples with 0 exceedances of criteria.
	D.O. (% sat)	Very Good	At least 10 samples with 0 exceedances of criteria.
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

LAKE WINNISQUAM - AHERN STATE PARK	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.
LAKE WINNISQUAM - BELMONT TOWN BEACH	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
LAKE WINNISQUAM - BELMONT TOWN BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
LAKE WINNISQUAM - BARTLETTS BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.
LAKE WINNISQUAM - BARTLETTS BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
LAKE WINNISQUAM - SANBORNTON TOWN BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
LAKE WINNISQUAM - SANBORNTON TOWN BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.
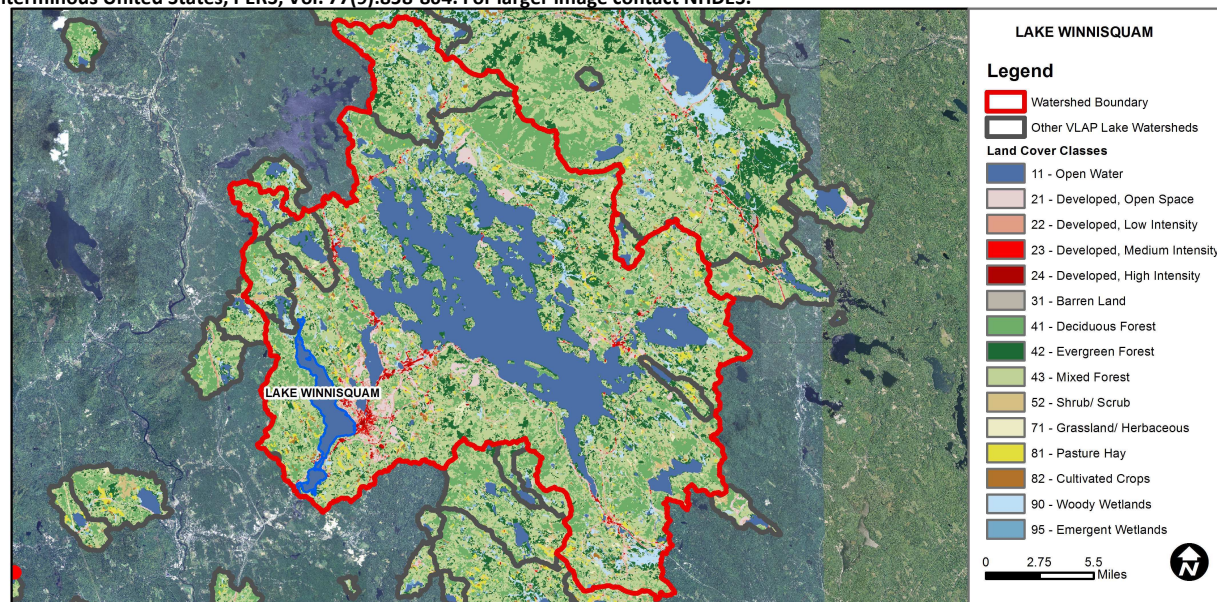
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	21.4	Barren Land	0.11	Grassland/Herbaceous	0.51
Developed-Open Space	4.8	Deciduous Forest	17.08	Pasture Hay	1.83
Developed-Low Intensity	1.65	Evergreen Forest	11.12	Cultivated Crops	0.52
Developed-Medium Intensity	0.7	Mixed Forest	32.34	Woody Wetlands	3.2
Developed-High Intensity	0.23	Shrub-Scrub	2.67	Emergent Wetlands	0.57

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic*)

- **CHLOROPHYLL-A:** Chlorophyll levels were low and well below the NH lake median. Historical trend analysis indicates relatively stable chlorophyll since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Conductivity and chloride were slightly greater than the NH lake medians likely due to road salting practices.
- **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer) and hypolimnetic (lower water layer) phosphorus was low throughout the summer. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus since monitoring began. We hope to see this continue! Metalimnetic phosphorus was slightly elevated in July possibly due to a layer of algae. Tributary phosphorus levels were low, and have been decreasing in Black Brook. We hope to see this continue!
- **TRANSPARENCY:** Transparency decreased slightly from 2011 however was much greater than the NH lake median. Historical trend analysis indicates a relatively stable transparency since monitoring began.
- **TURBIDITY:** Turbidity levels were low at all stations.
- **pH:** pH tends to fluctuate below desirable levels in the hypolimnion.
- **RECOMMENDED ACTIONS:** Maintain current monitoring program and schedule a biologist visit in 2013 to measure dissolved oxygen and temperature levels at the deep spot. Keep up the great work!

Station Name	Alk.	Chlor-a	Chloride	Cond.	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	ug/l	m		ntu	
						NVS	VS		
Black Bk			14	95.7	7			0.80	6.96
Epilimnion	6.85	2.56	14	92.4	3	7.25	8.98	0.43	7.08
Metalimnion				94.2	13			0.81	6.84
Hypolimnion				94.9	6			0.53	6.52
Winnipesaukee R			12	85.8	5			0.50	7.08

Table 1. 2012 Average Water Quality Data for LAKE WINNISQUAM, POT ISLAND

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	Stable	Data not significantly increasing or decreasing.
Transparency	Stable	Data not significantly increasing or decreasing.
Phosphorus (epilimnion)	Improving	Data significantly decreasing.

Historical Deep Spot
Chlorophyll-a, Epilimnetic Total Phosphorus & Transparency Data
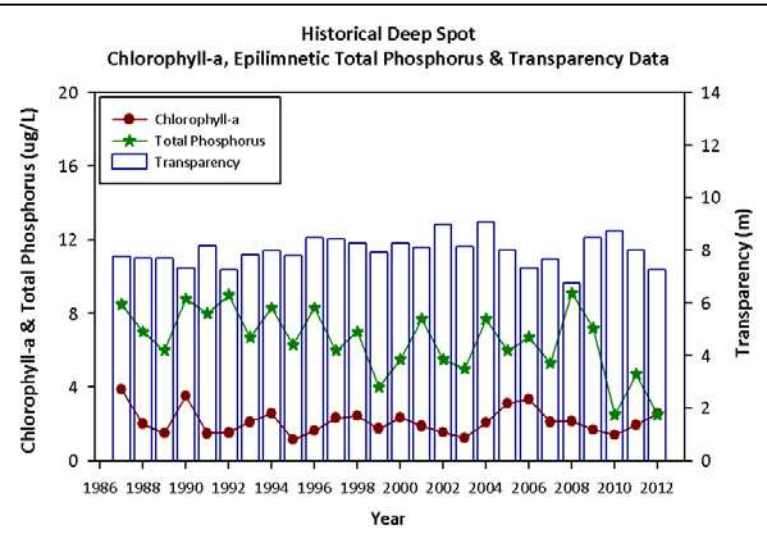
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